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FRE fire vehicle supports Operation Iraqi Freedom

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WRIGHT-PATTERSON AIR FORCE BASE, Ohio — Researchers from the Air Force Research Laboratory recently completed air-lift and air-drop certification for the first response expeditionary (FRE) fire vehicle, a lightweight, deployable apparatus that enables crash and rescue firefighting services in a variety of mission profiles.

The vehicle, which was developed by AFRL's Materials and Manufacturing Directorate to meet Air Combat Command and civil engineering requirements, was successfully dropped three times from a C-130 aircraft at an altitude of 15,000 feet during testing at Pope Air Force Base, N.C.

Before these evaluations, prototype FRE vehicles were developed and deployed during Operation Iraqi Freedom in response to an urgent need for an easily operable, lightweight, highly effective fire protection system for helicopters, aircraft, tent cities, hot pit refueling and other bare base applications.

The first response expeditionary fire vehicle sits in front of a much larger P-19 fire truck at a small U.S. seized Iraqi air base. (Air Force photo)

"The system is designed to provide firefighters with the quick-reaction capability they will need to extinguish small aircraft or structural fires before they become uncontrollable," said Virgil Carr, a program manager from the directorate's deployed base systems branch.

"The FRE Fire Vehicle was developed to meet fire protection, and crash and rescue needs in scenarios where there is a potential for fire, but where full-sized crash and rescue fire trucks haven't yet been deployed or are unavailable " Carr said. "The FRE bridges that gap between fire extinguishers and full-sized trucks."

Conventional firefighting foam agents and equipment that are usually deployed to remote locations before fire trucks arrive are primarily effective in extinguishing two-dimensional fires. These 2-D fires are also called pool fires because their source is a pool of fuel or another flammable liquid that has collected on the ground.

But in the case of many aircraft accidents, when fuel or hydraulic fluid from damaged lines and equipment continuously replenishes the flammable liquid pool on the ground, a fire becomes increasingly difficult to extinguish with foam alone.

"With the FRE, we have conclusively demonstrated the unit's effectiveness against both the pool and running fuel fire," Carr said. "We believe this phenomenon is associated with the superb penetration of the high-pressure water, but are conducting additional evaluations and analysis to ascertain reasons for such effectiveness. We also intend to achieve even greater firefighter capability by scale-ups of the high pressure water technology."

The FRE vehicle consists of a Rosenbauer ultra high-pressure system with a six-cylinder, 22 horsepower Briggs and Stratton engine, and a 1,500 pounds-per-square-inch pressure pump. The 60-gallon system is capable of providing 14 gallons per minute of foam or water to the nozzle, which delivers the firefighting agents in either a mist, high-pressure stream, or aspirated foam.

This year, AFRL has delivered six prototype units, where the system was mounted on a John Deere military gator, to Air Combat Command and the U.S. Central Command Air Forces.

Two additional units will be delivered to the Air Force Special Operations Command. These organizations are responsible for executing and planning contingency operations in the Iraqi region. @